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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,127	03/10/2004	Tomoyuki Amano	Q80299	2473
23373	7590	06/22/2004	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			COMPTON, ERIC B	
			ART UNIT	PAPER NUMBER
			3726	

DATE MAILED: 06/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/796,127

Applicant(s)

AMANO ET AL.

Examiner

Eric B. Compton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-32 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 25-32 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/10/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 25-26 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. 5,941,124 to Tan.

Regarding claim 25, Tan discloses a method of manufacturing a face gear (12) comprising utilizing a numerical controlled milling machine to form a plurality of tooth portions (16) of the face gear. See Col. 7, lines 50-53.

Regarding claim 26, the face gear is directly machined by the numerical controlled milling machine to form the plurality of tooth portions. *Id.*

Regarding claim 31, as shown in Figure 4C, multiple tool passes may be necessary to form the gear tooth depending on the accuracy requirements. Col. 7, lines 31-32. Each tool pass inherently formed a plurality of slight stepped portions. See *also* U.S. 3,673,837, Figure 1; JP 2001-79713, Figure 6; JP 2000-043832 Figure 6 (showing a plurality of stepped portions on each of the plurality of tooth portions.). *Compare* these reference *with* Figures 8-12 of Applicant.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of U.S. Pat. 5,552,995 to Sebastian.

AAPA discloses,

The application of the face gear of this type is very limited to such as a spinning reel for fishing and a rear rotor of a helicopter, and is generally formed by zinc casting, aluminum alloy casting and forging, stainless steel molding (metal injection molding (MIM)), or the like. Each of these methods is a molding or forming method which requires a mold or a die assembly.

The mold or die assembly for forming such a face gear is generally fabricated as follows. Namely, a pinion cutter is fabricated in advance by a cutting tool called a hob, this pinion cutter is then pressed against a copper material to fabricate an electrode for a mold having a tooth profile corresponding to the gear portion of the face gear, and a mold steel is subjected to electrical discharge machining using this electrode.

Specification, page 2. Thus AAPA, discloses that it is known to use a mold for molding gear teeth for a finishing reel. However, AAPA does not disclose forming the mold by utilizing a numerical controlled milling machine.

Sebastian discloses a method of engineering parts to be cast and/or molding, including gears. See Col. 15, lines 1-2. Throughout the manufacturing process, the

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various elements, including tooling, e.g., molds are formed by CAD/CAM. Col. 19, line 15, 56-65. CAD/CAM involves the uses of numerically controlled machines. See Col. 2, lines 55-61.

Regarding claims 25 and 27, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have formed the mold of AAPA by utilizing a numerical controlled milling machine, in light of the teachings of Sebastian, in order to rapidly produce the electrode by having the tool path stored in a computer and more efficiently design and manufacture parts. *Id.*; see also Col. 18, lines 3-16.

5. Claims 25 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of U.S. Pat. 6,204,466 to Tabor.

AAPA discloses,

The application of the face gear of this type is very limited to such as a spinning reel for fishing and a rear rotor of a helicopter, and is generally formed by zinc casting, aluminum alloy casting and forging, stainless steel molding (metal injection molding (MIM)), or the like. Each of these methods is a molding or forming method which requires a mold or a die assembly.

The mold or die assembly for forming such a face gear is generally fabricated as follows. Namely, a pinion cutter is fabricated in advance by a cutting tool called a hob, this pinion cutter is then pressed against a copper material to fabricate an electrode for a mold having a tooth profile corresponding to the gear portion of the face gear, and a mold steel is subjected to electrical discharge machining using this electrode.

Specification, page 2. Thus AAPA, discloses that it is known to form gear teeth for a finishing reel using a electrode. However, AAPA does not disclose forming the electrode by utilizing a numerical controlled milling machine.

Tabor discloses a method of manufacturing an electrode for forming gear teeth by using a CNC milling machine. See Col. 3, lines 51-62.

Regarding claims 25 and 28, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have formed the electrode of AAPA by utilizing a numerical controlled milling machine, in light of the teachings of Tabor, in order to rapidly produce the electrode by having the tool path stored in a computer, rather than having to manually machine the electrode. *See Id.*

6. Claims 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tan in view of JP 08-131029 to Hitomi.

Tan discloses the invention cited above. However, the reference does not disclose that the gear is used in a fishing reel or the specific shape and structure of the gear as claimed by Applicant.

Hitomi discloses a fishing reel having a face gear (11). As shown in Figure 4, the face gear has Inclined surface formed on a reverse surface of a surface on which the plurality of tooth portions are formed, and at least a portion of the reverse surface located substantially in the read of the plurality of tooth portions is formed into a surface parallel to the surface on which the plurality of tooth portions are formed. *Compare* Figure 4 of Hitomi *with* Figure 1 of Applicant (showing identical shape and structure of face gear).

Regarding claim 29, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the face gear produced by the method of Tan in a fishing reel, in light of the teachings of Hitomi, in order to take advantage of high-speed flexible manufacturing technology. *See* Tan, Col. 1, lines 59-65; Col. 7, lines 50-65.

Regarding claim 30, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have formed the face gear produced by the method of Tan having the specific shape and structure claimed by Applicant, in light of the teachings of Hitomi, in order to form a face gear that can be used in a conventional design fishing reel, without having to redesign the reel.

7. Claims 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tan in view of JP 2000-042832 to Shimazaki and/or U.S. 3,673,837 to Tixier.

Tan discloses the invention cited above. As shown in Figure 4C, multiple tool passes may be necessary to form the gear tooth depending on the accuracy requirements. Col. 7, lines 31-32. Each tool pass inherently formed a plurality of slight stepped portions. See also U.S. 3,673,837, Figure 1; JP 2001-79713, Figure 6; JP 2000-043832 Figure 6 (showing a plurality of stepped portions on each of the plurality of tooth portions.). Compare these reference with Figures 8-12 of Applicant.

However, Tan does not explicitly disclose crushing the plurality of stepped portions so as to form a hardened layer.

Shimazaki and Tixier disclose methods for removing tool marks on gear teeth. In Shimazaki, pressure molding gears (5, 6) remove the marks by plastically deforming the tool marks, i.e., crushing the stepped portions, to smooth the surface. Similarly, in Tixier, crushing, to smooth the surface, deforms the stepped portions. Figure 2; Col. 1, lines 49-60. The deforming step, i.e., crushing step inherently forms a hardened layer. See e.g., *Id.* at Col. 2, lines 9-10 (discussing increased strength of gear).

Regarding claims 31-32, it would have been obvious to one having ordinary skill in the art at the time of the invention, to have crushed the plurality of stepped portions of the gear produced by the method of Tan, in light of the teachings of Shimazaki and/or Tixier, in order to removing surface irregularities resulting from the milling operations, without a material removal operation. Tixier, Col. 1, lines 45-60.

Prior Art References

The prior art references listed on the enclosed PTO-892, but not used in a rejection of the claims, are cited for their teachings of forming face gears.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B. Compton whose telephone number is (703) 305-0240. The examiner can normally be reached on M-F, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter B. Vo can be reached on (703) 308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Eric Compton
Patent Examiner